



ELECTRON TUBE DEPARTMENT ■ COMPONENTS DIVISION
INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION, CLIFTON, NEW JERSEY

F-7339
TRAVELING
WAVE TUBE

FORMERLY
TYPE D-92

TENTATIVE

DESCRIPTION:

The F-7339 is a 1 kilowatt pulse traveling wave amplifier tube having 27 db gain and 8500 to 9600 mc frequency range. It is constructed in a rugged metal envelope with a helix type slow wave structure. The integral matching circuit is in 50 ohm coaxial line and is provided with type "N" connectors. The tube is self-aligning in the external solenoid which is required to provide a uniform magnetic field. A convergent beam gun and oxide impregnated cathode are used. Duty cycles up to .005 and pulse widths up to 10 microseconds can be used.

ELECTRICAL RATINGS, ABSOLUTE VALUES:

Heater Voltage	6.3 ($\pm 10\%$)	volts
Heater Current	2.5	amperes
Maximum Anode Voltage (Note 1)	12	kilovolts peak
Maximum Shell Current (Note 2)	0.5	ampere peak
Maximum Collector Voltage (Note 3)	12.5	kilovolts peak
Maximum Collector Dissipation (Note 4)	150	watts average
Maximum R-F Input Power	5	watts average
Maximum R-F Output Power	10	watts average
Maximum Duty Cycle	.005	
Maximum Pulse Width (Beam)	10	microseconds
Maximum Cathode Current	2.5	amperes peak

ELECTRICAL INFORMATION:

Maximum Frequency (Note 5)	9600	mc
Minimum Frequency (Note 5)	8500	mc
Minimum Cold Transmission Loss	60	db
Capacitance		
All Gun Elements to Shell	5	μfd

MECHANICAL INFORMATION:

Type of Cathode	Oxide Impregnated Unipotential
Base, Small Shell Duodecal, 5 Pin	JEDEC Designation B5-57
Type of Envelope	Metal
Magnetic Field Strength	2000-2800 Gauss
Length of Magnetic Field	6.75 inches uniform
Mounting Position	Any
Weight (not including magnet)	1 lb. 7 ozs.
R-F Connections	50 ohm coax with Type "N" Jack UG-23B/U
Type of Cooling	Forced Air
Air Flow on Collector Radiator (Note 4)	30 cfm
Glass Temperature	160°C max.

TYPICAL OPERATION AS POWER AMPLIFIER:

Center Frequency	9000 mc
Anode Voltage (Note 1)	11 kilovolts peak
Cathode Current	1.8 amperes peak
Collector Voltage (tied to Shell)	11 kilovolts peak
Collector Current	1.5 amperes peak
Power Output (at center frequency)	1.5 kilowatts peak
Bandwidth for $P_o = 1$ kilowatt	8.5 to 9.6 kmc
Gain (Note 6)	27 db
Duty	.001
Pulse Width	2 microseconds

Note 1: All voltages shown are with respect to cathode. Anode and helix are connected internally to the shell. The shell is normally operated at ground potential and the anode connection is made to the shell of the solenoid.

Note 2: The shell current is the difference between cathode current and collector current. Since this current, in general, should be minimized, it may be desirable to measure current from shell to ground. In making this measurement, care should be taken that both the tube and solenoid are completely insulated from ground. Once operating characteristics (voltage, current, and magnetic field) have been established, shell should be grounded.

- Note 3: The tube may be operated with the collector tied to the shell (anode and helix) or may be operated at several hundred volts positive with respect to shell with slight improvement in beam transmission. The potential difference between collector and shell must be limited to 500 volts maximum.
- Note 4: Forced air cooling is required for average collector power in excess of 10 watts. As the collector power is increased, the air flow required increases. At the maximum collector power of 150 watts, a minimum air flow of 30 cfm through the cooling fins is required.
- Note 5: Useful gain and power output exists below 8500 mc and above 9600 mc and can be utilized by adjusting anode voltage to optimize the frequency range desired. However, bandwidth cannot be extended both upward and downward simultaneously and maximum gain and power output outside the normal bandwidth will usually be lower than rated values.
- Note 6: This gain is obtained over the 8.5 to 9.6 kmc bandwidth at the power level indicated. Since this is in the power saturation region, small signal gain will be approximately 10 db higher.

OPERATING INSTRUCTIONS:

- (1) Heater warm up of 2 minutes before applying high voltage is recommended.
- (2) Initial adjustments should be done at low duty cycle (less than .001 to prevent tube damage due to high shell (interception) current.

Standard solenoids to operate this tube are available, and solenoids designed for particular applications can be supplied.

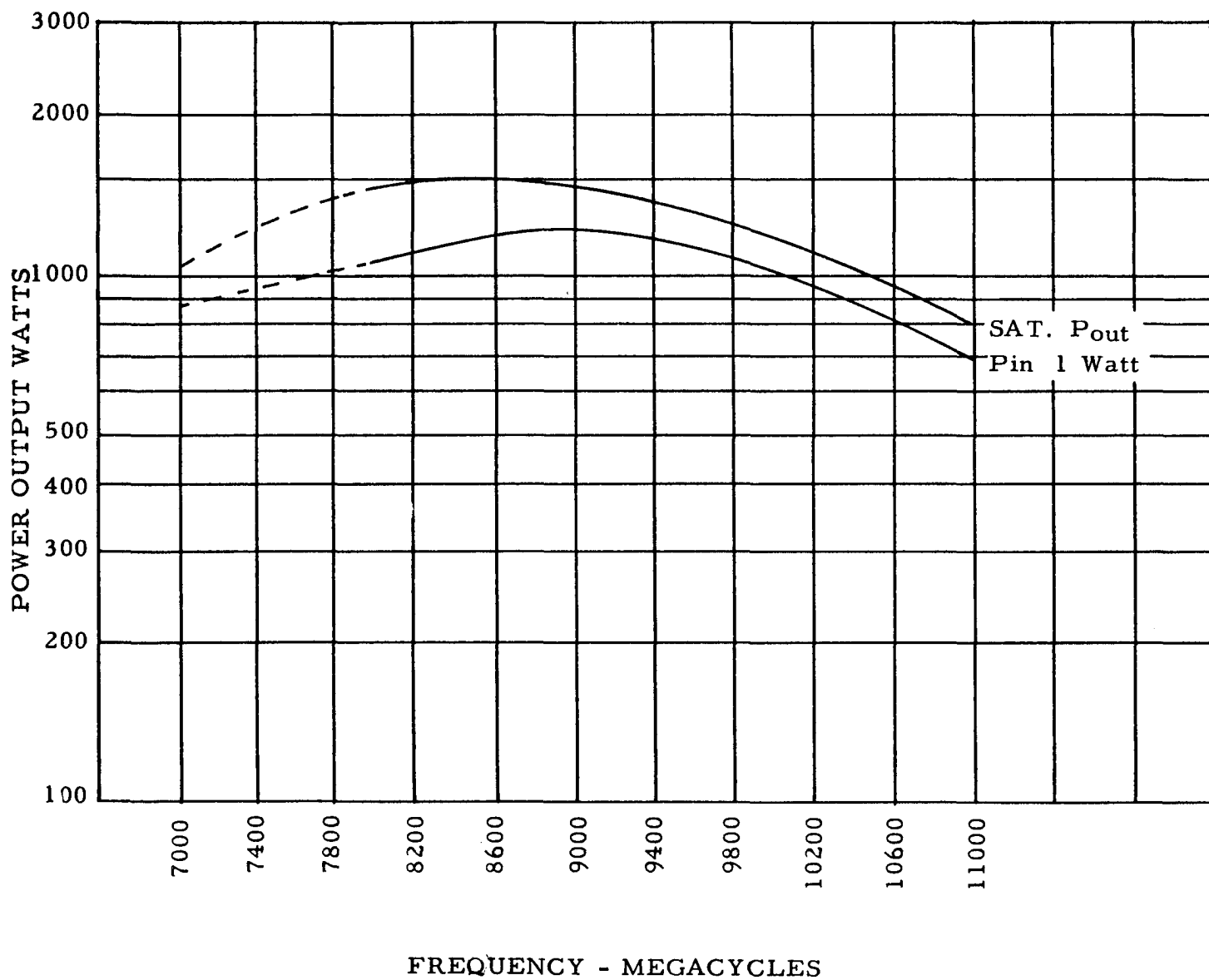
Additional information for specific applications can be obtained from the

Electron Tube Applications Section
ITT Components Division
Box 412
Clifton, New Jersey

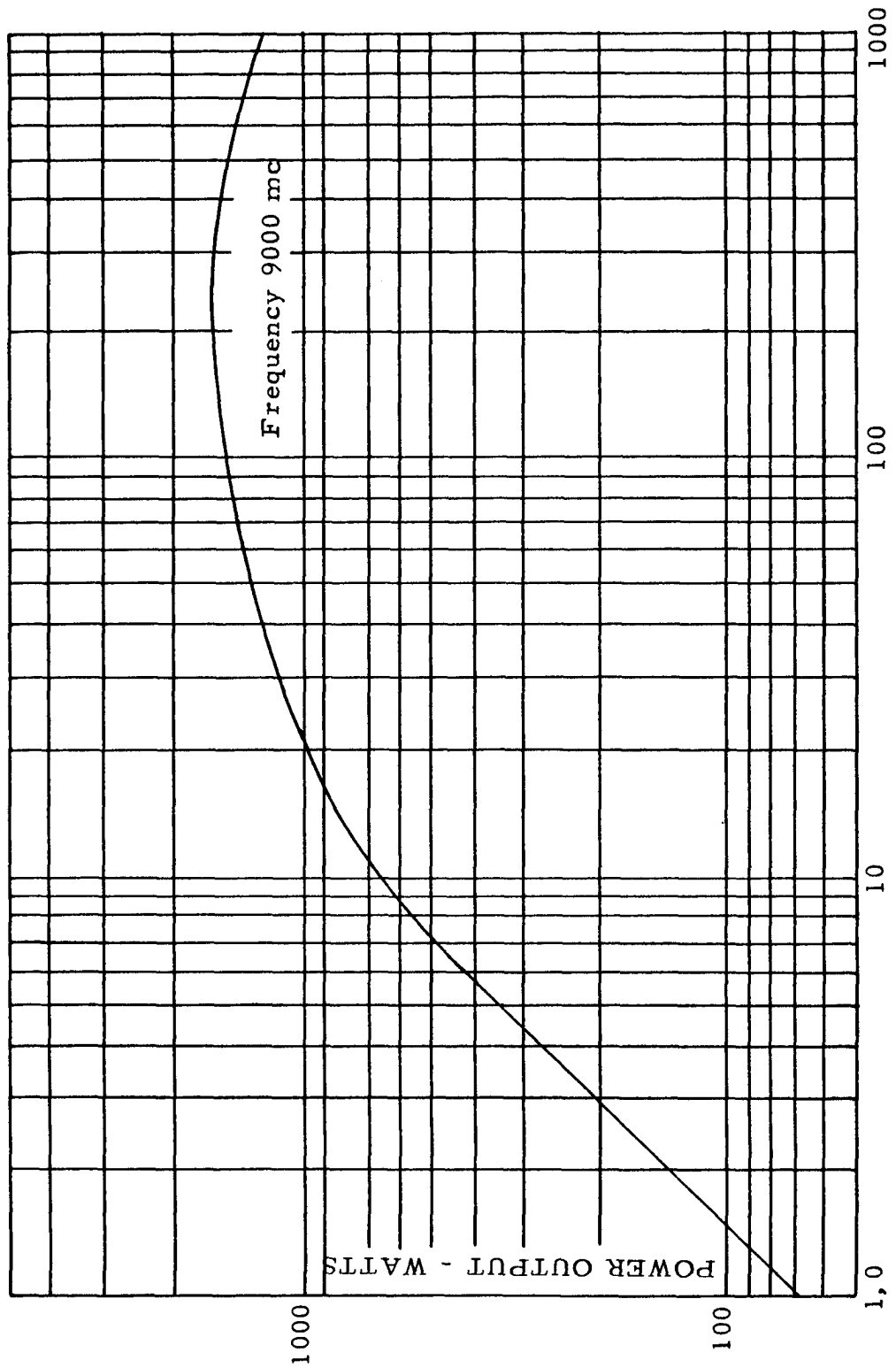


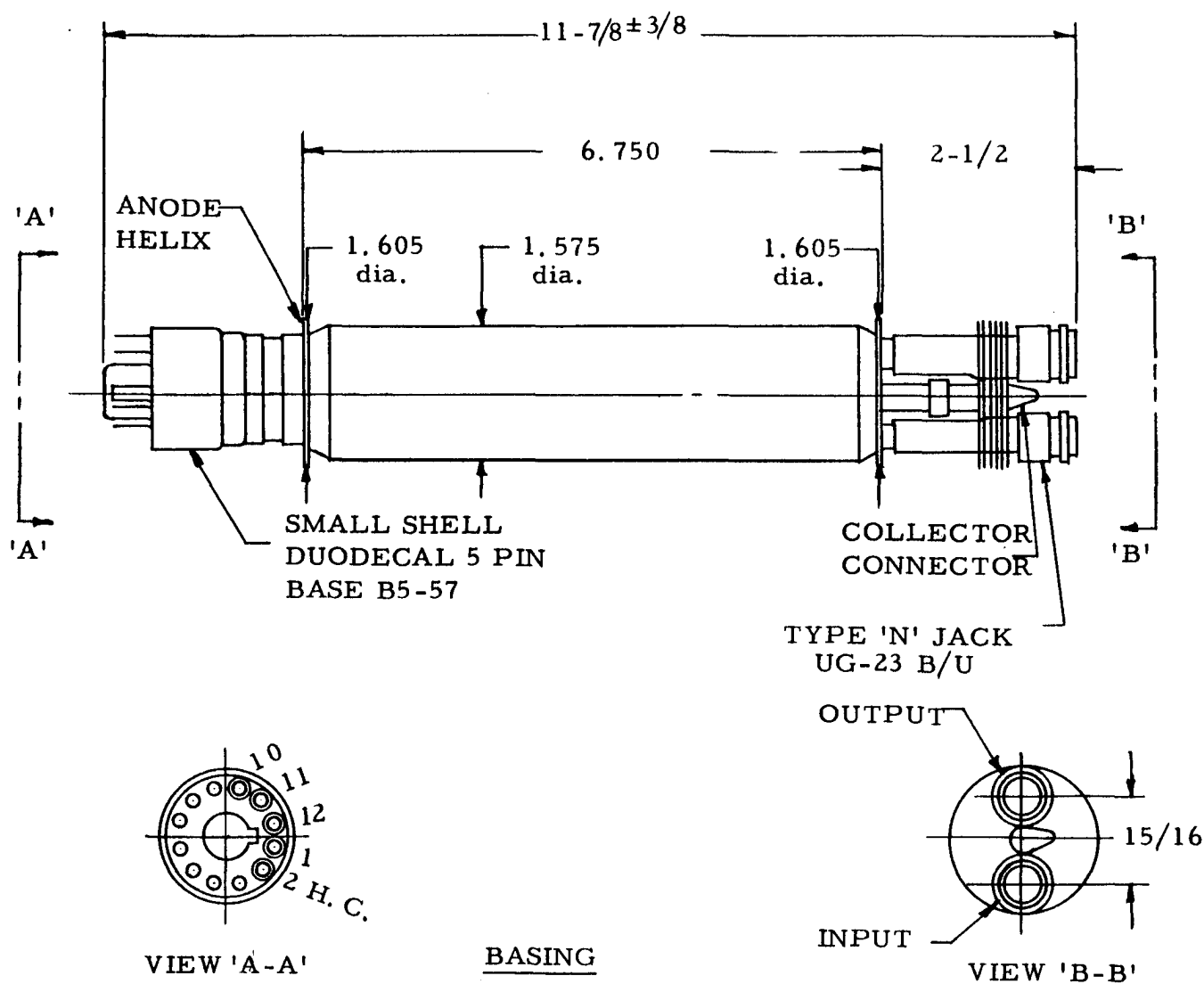
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TYPICAL P_{out} VS. FREQUENCY CHARACTERISTICS



TYPICAL P_{out} VS. P_{in} CHARACTERISTIC





BASING

<u>PIN</u>	<u>ELEMENT</u>
1	No Conn.
2	Heater-Cathode
10	Heater
11	No conn.
12	No conn.

OUTLINE

TRAVELING WAVE TUBE F-7339